Ch. 2 Test

Quadratics

- Finding zeros + vertex
- Application Problems

Polynomials

- Graphs with #'s (multiplicity, even/odd functions, leading coefficient)
- Zeros (Rational Zero Test, Descarte's Rule of Signs, Upper/lower bound)

Rational Functions

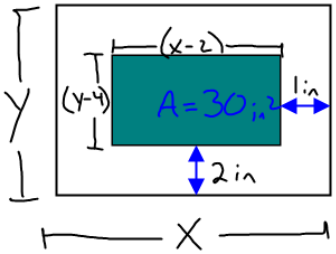
- Sketching graphs with #'s
- Asymptotes
- Domain
- intercepts
- Application problem

Imaginary Numbers

- imaginary zeros
- conjugate zeros
- +, −, ×, ÷

Station 7

$(x-2)(y-4)=30$



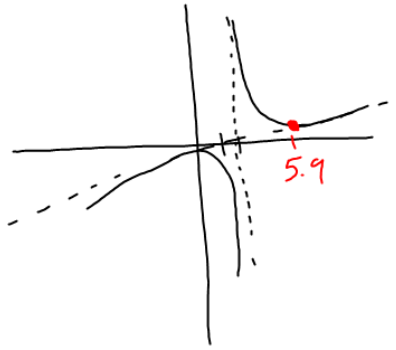
Area Page $= x \cdot y$

$$\frac{(x-2)(y-4)}{(x-2)} = \frac{30}{(x-2)}$$

$$y-4 = \frac{30}{x-2}$$

$$+4 \quad +4$$

$$y = \frac{30}{x-2} + 4$$



$$A_p = x\left(\frac{30}{x-2} + 4\right)$$

or

$$A_p = \frac{30x}{x-2} + 4x \cdot \frac{x-2}{x-2}$$

or

$$A_p = \frac{30x}{x-2} + \frac{4x(x-2)}{x-2}$$

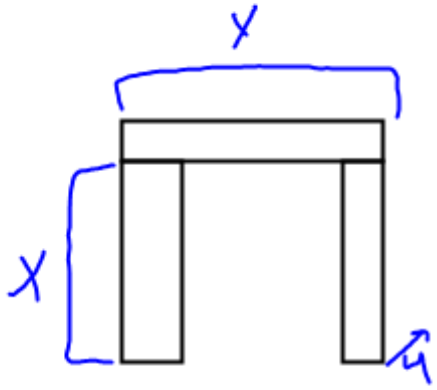
or

$$A_p = \frac{30x + 4x^2 - 8x}{x-2}$$

or

$$A_p = \frac{4x^2 + 22x}{x-2}$$

#1 Quadratics Applications 2



$$400 = \underbrace{2}_{\text{2 sides}} \cdot \underbrace{4}_{\$ \text{ per sq. ft}} \cdot 2x + 5 \cdot 4 \cdot y$$

$$400 = 16x + 20y$$

$$y = \frac{400 - 16x}{20} = 20 - \frac{4}{5}x$$

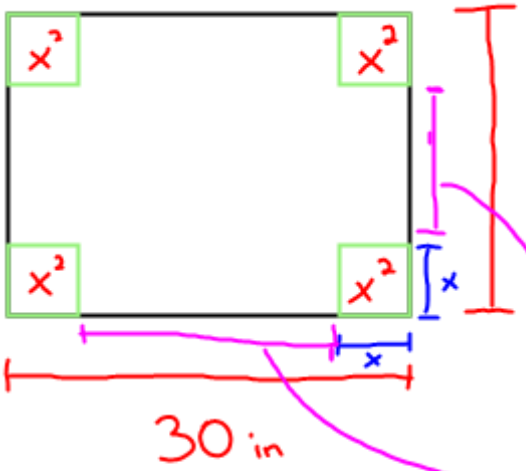
$$V(x) = l \cdot w \cdot h$$
$$= y \cdot x \cdot 4$$
$$= \left(20 - \frac{4}{5}x\right) \cdot 4x$$

graph and get max

at $(12.5, 500)$

max volume is $\boxed{500\ ft^3}$

#2 Quadratics Applications 2



a) $h = x$

$(20-2x)(30-2x)(x)$

$V = 4x^3 - 100x^2 + 600x$

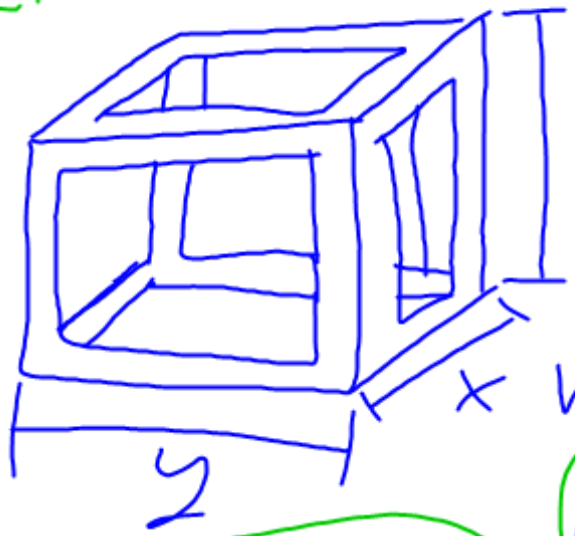
b) $(20-2x) > 0$

$0 < x < 10$

graph

c. maximum $V = 1056\ in^3$ when $x \approx 3.92$ in

#3 Quadratics Applications 2



a) $8x + 4y = 24$

$y = \frac{24 - 8x}{4}$

$y = 6 - 2x$

$V = x^2 \cdot y$

$x^2 \cdot (6 - 2x)$

$6x^2 - 2x^3$

answer

b) $0 < x < 3$

c) $x = 2$ $6(2)^2 - 2(2)^3$

$24 - 16 = 8\ ft^3$

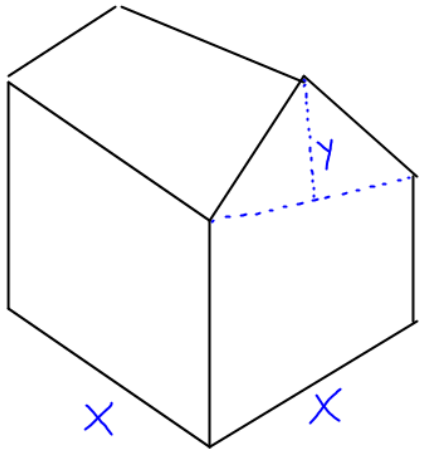
b) $0 < x < 3$

c) $24 - 16 = 8\ ft^3$

#4 Quadratics Applications 2

$V = x^3 + \frac{x \cdot y}{2} \cdot x$

cube, roof



$y = 6 - x$, so

(a) $V = x^3 + \frac{x \cdot (6-x)}{2} \cdot x$

or

$V = x^3 + \frac{6x^2 - x^3}{2}$

or

$V = 0.5x^3 + 3x^2$

or

$V = (x^2)(0.5x + 3)$

(b) $80 = 0.5x^3 + 3x^2$

$0 = 0.5x^3 + 3x^2 - 80$

4	$\frac{1}{2}$	3	0	-80
		2	20	80
	$\frac{1}{2}$	5	20	0

→ Nonreal roots

$x = 4$

(c) Graph part (a) and find max. $x = 6$ ft, $V = 216$ ft^3